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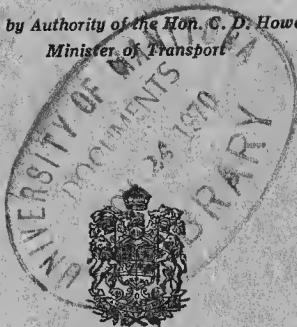
1939

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DEPARTMENT OF TRANSPORT

3) **CHURCHILL**
AND
**THE HUDSON
BAY ROUTE**

*Published by Authority of the Hon. C. D. Howe, M.P.
Minister of Transport*



OTTAWA
J. O. PATENAUME, I.S.O.
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
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CHURCHILL AND THE HUDSON BAY ROUTE

Earlier History (1610-1847)

Discovery of Hudson Bay and Churchill River

More than a century elapsed, following the discovery of Baffin Land and the Labrador peninsula by John Cabot in 1498, before the first explorer penetrated the mystery that lay beyond those inhospitable shores. In all those years, except for the two voyages of Jacques Cartier, the Old World showed no interest in the northern portion of the New. With the opening of the seventeenth century, stirred by eager hopes, a wave of colonization gathered itself together in Europe to break along the coast of North America from Virginia to the Gulf of St. Lawrence. The new activity, as it quickened the ports of the Old World, sent captains on long voyages of discovery to the western continent. Among these was Henry Hudson who, in 1610, discovered the Strait and Bay that bear his name. After wintering at the southeast corner of James Bay, Hudson, with a few sick sailors, was cast adrift in an open boat by his mutinous crew, never to be heard of again. Another of these navigators and explorers was Thomas Button, who entered the Bay in 1612, wintered at the mouth of the Nelson river (which he named after his mate, who died there), and returned safely to England next year. In 1631 rival interests sent Luke Foxe and Thomas James to explore the Bay. Foxe returned to London the same year but James wintered on Charlton Island, in the Bay that was later named after him, and returned the following summer to Bristol. These four explorers were fitted out by English promoters in the hope that they might reach the East by a westerly route. None of them brought any gain to those who employed them.

A possibility that he saw the Churchill river may be read into the fragments still remaining of Button's story, but conclusive evidence is lacking. The authentic discoverer was Jens

Munck, son of a Danish nobleman. Munck, with two ships, sailed from Copenhagen on May 16th, 1619, in search of the Northwest passage. His own ship arrived at Churchill on September 7 and the other ship arrived two days later. So perilous had been the passage through the ice of Hudson Strait and so stormy the voyage across the Bay that he decided to winter there rather than attempt the return voyage that same season. The issue of such an attempt could hardly have been more disastrous than the fate that befell him at Churchill. When spring came at last and the harbour was clear of ice all had perished with the exception of Munck and two others. These three managed to get the smaller vessel afloat and crossed to Norway. Though Munck published a narrative of his experience in 1624, neither he nor any of his countrymen went again to Hudson Bay. In his narrative Munck omits the latitude and longitude of his discovery, yet there can be no doubt that the river he found was the Churchill. In the first place, the map he drew is too good a reproduction of Churchill to be mistaken for any other river on the Bay. And, in the second place, after the Hudson's Bay Company had opened a post at Churchill, a brass cannon, stamped with the Danish Royal mark, was found in the tidal flats nearby.

Munck's camp must have been at or very near the site now occupied by the Hudson's Bay Company post. It was fitting, therefore, that when it was proposed to erect a tablet in memory of Munck and his companions the Anglican Mission church at the post should have been chosen to receive it. The tablet, which was unveiled on Sunday August 19, 1928, was donated by a number of people of Danish nationality who live in New York City.

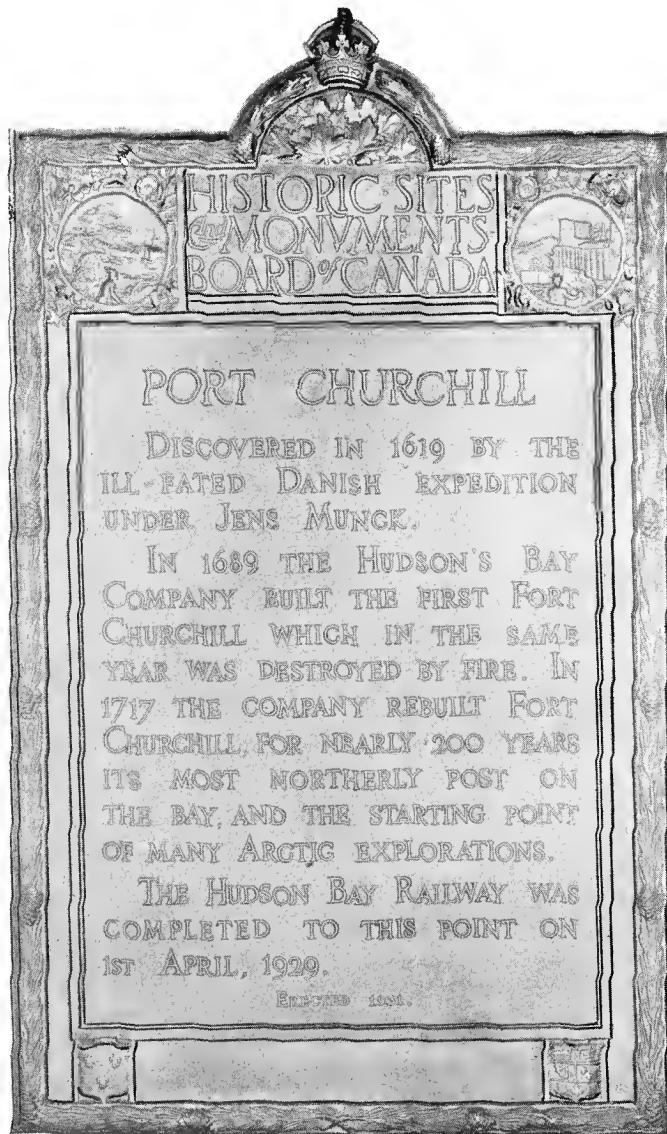
Across the river, in Battery Park, a cairn, built of beach stones in 1931, stands as a monument to Munck and those who made history at Churchill. The cairn, as well as the tablet which is attached to it, are shown in the accompanying cuts.

Beginnings of the Fur Trade

It was in search of the silks and spices of the East that these earlier adventurers came to the shores of Hudson Bay. The disappointment that met them blinded the English and Danish explorers alike to the true wealth of the country. It remained for two Frenchmen to discover that unimagined wealth lay in the fur trade. These men, Pierre Radisson and Chouart Groseilliers.



Cairn in Battery Park.



Tablet on Cairn.

spent the years 1658 to 1662 roaming the territory that stretched from the Detroit to the Red river and from the Missouri to the Albany. The scene of their travels during the summer of 1662 is designated by Radisson in his journal as the "Bay of the North." This may or may not have been James Bay but there can be no doubt that the travellers learned on trustworthy evidence that "the Bay of the North" was rich in furs. Returning to Quebec from "the Bay of the North" in 1663 with many canoes loaded with furs, they were heavily fined for infringing the governor's fur monopoly.

Hudson's Bay Company Chartered

Knowing by experience the difficulty of reaching that valuable fur country by canoe and portage, the two friends had the insight to recognize that the best means of reaching it was by sea. Turning away from New France, where they had been thwarted, they attempted to find assistance in other quarters for an expedition to Hudson Bay by sea. After numerous defeats and disappointments they landed in England penniless in 1666. Fortunate in being presented to King Charles, their story caught his fancy and they won his favour. As a result two ships were outfitted by London merchants and dispatched to Hudson Bay in 1668. The ship in which Radisson sailed turned back but the other, the *Nonsuch*, with Groseilliers on board, continued on its way until it arrived at James Bay. There the party spent the winter and built fort Charles on the Rupert River. The following June the ship sailed for London with a full cargo of furs. The backers of the expedition received it enthusiastically on its arrival and proceeded at once to apply for incorporation. This was granted them by Royal Charter dated May 2nd, 1670, as "The Governor and Company of Adventurers of England trading into Hudson's Bay." Thenceforward for nearly two hundred years, the chief factor in the development of that region was to be the Hudson's Bay Company.

Rediscovery of Churchill River

It was nearly a century after the melancholy failure of Munck's expedition before permanent settlement was effected on the Churchill River. For the greater part of that time the very existence of the river appears to have been unnoticed in company circles. In 1686 Capt. J. Abrahams, exploring the coast to the

north of Nelson River for the Hudson's Bay Company, rediscovered the forgotten river. He returned to England the same year and reported his discovery to the company. On February 8th, 1688, the committee resolved "that the Churchill River Bee settled this yeare with a Good Shipp a Competent Cargo for Trade and Materials for White Whale ffishings." It must have been at this date that the present name was given the river in honour of Lord Churchill, later the Duke of Marlborough, who had been elected governor of the company on April 2nd, 1685, in succession to the Duke of York. The latter in that year ascended the throne as James II.

At that time the Hudson's Bay Company had five posts on the Bay, viz., Rupert House, Albany and Moose Factory, at what was known as the "Bottom of the Bay," and New Severn and York fort on the west coast. The last of these was the principal post on the Bay and had been named in honour of the Duke of York in the time of his governorship. In the old records Port Nelson is frequently referred to but it should be remembered that a permanent post was never established on the Nelson river. York fort or factory, which is upon the adjoining Hayes river, is to be understood wherever Port Nelson was mentioned by officials of the company.

The decision of the company to settle Churchill was not acted upon until June 6th, 1688, when Capt. James Young sailed in the *Dering* from Gravesend accompanied by another ship for York factory. Though the committee had on March 7th, 1688, reconsidered its resolution to establish a whale fishery, a harpooner, Edward Mills, was included in the crew. The fruit of his labour appears in the entry in the minutes of the company for December 18th, 1689, of twenty-eight casks of White whale blubber oil.

Founding of Churchill Post

Capt. Young arrived at Churchill river from York factory with men and supplies to establish a post some time before June 17th, 1689. The partially completed building on which they were working was burned down on August 1st or 2nd. At a later date James Knight, who had means of ascertaining the facts, hinted in his journal that it was burned in disappointment over the forbidding aspect of the country. Such goods as had been saved from the flames were put on board ship and the whole party returned to York factory. Capt. Young proceeded thence to England with the annual cargo.

English trade with Hudson Bay suffered severely during the years 1690 to 1713 on account of the wars between France and England. In 1713 peace was finally restored by the treaty of Utrecht. During most of this time York factory had been in the hands of the French. When the time came for it to be handed back formally to the Hudson's Bay Company, the official to receive it was James Knight, who was despatched from England for the purpose. His previous experience in the service of the company had impressed him with the advisability of getting in touch with the northern Indians by establishing a post on the Churchill river. It was not until 1717 that he was ready for the enterprise. He arrived at Churchill on July 14th, 1717. Only one site suitable for the new factory and fort could be found, namely the one occupied ever since by the Hudson's Bay Company. It is identified by the brass cannon found there as the one at which Munck had wintered nearly one hundred years before. The preparation for winter was carried on in the face of many difficulties. Food was short, game was scarce, fish could seldom be caught. Only the arrival of a supply ship on August 14th saved the expedition from failure. Timber could only be obtained at great labour from a spot twelve miles up the river. With hard work a storehouse and a dwelling were finished before winter set in. In 1718 the timber fort was built. To this building the name "Prince Wale's fort" was given in honour of George, Prince of Wales, later to become George II.

The capture of York factory by the French in 1694 and the subsequent loss of revenue must have impressed upon the company officials the advisability of fortifying Churchill, the best harbour on the Bay, so that it could repel hostile attack. By 1731 the company had decided to adopt this policy and Richard Norton, the governor of Churchill, was commissioned in that year to erect a stone fort on Esquimo point at the mouth of the Churchill river.

Fort Prince of Wales

Norton arrived at Churchill factory with workmen and equipment on July 28th, 1731. On August 6th the fort was staked out—one hundred yards square at the tips of the bastions. Excavation for foundations was begun on August 23rd at the south bastion. On June 3rd, 1732, with due ceremony, the first stone of the foundations was laid. In 1733 J. Robson, an experienced stone mason came out. The first six cannon arrived in

1734 and three were mounted in the same year. In 1736 when Robson's contract with the company expired and he returned to England, the south and the east bastions had been completed as well as the curtain wall between them, and some progress had been made on another curtain wall and bastion.

Norton was not a stone mason and as he tenaciously held all authority in his own hands there had been a good deal of friction between Robson and himself. An example of this is seen in the alteration, on Norton's order, of the width of the ramparts from forty-two to twenty-five feet. The inadequacy of this width became evident to all when the first gun was fired and recoiled from off the rampart. It then became necessary to pull down part of the finished work and increase the width. Fortunately that could be done without disturbing the outer wall of the fort. Robson, in his book published in 1752, justified himself in this as well as in further examples of faulty workmanship by others.

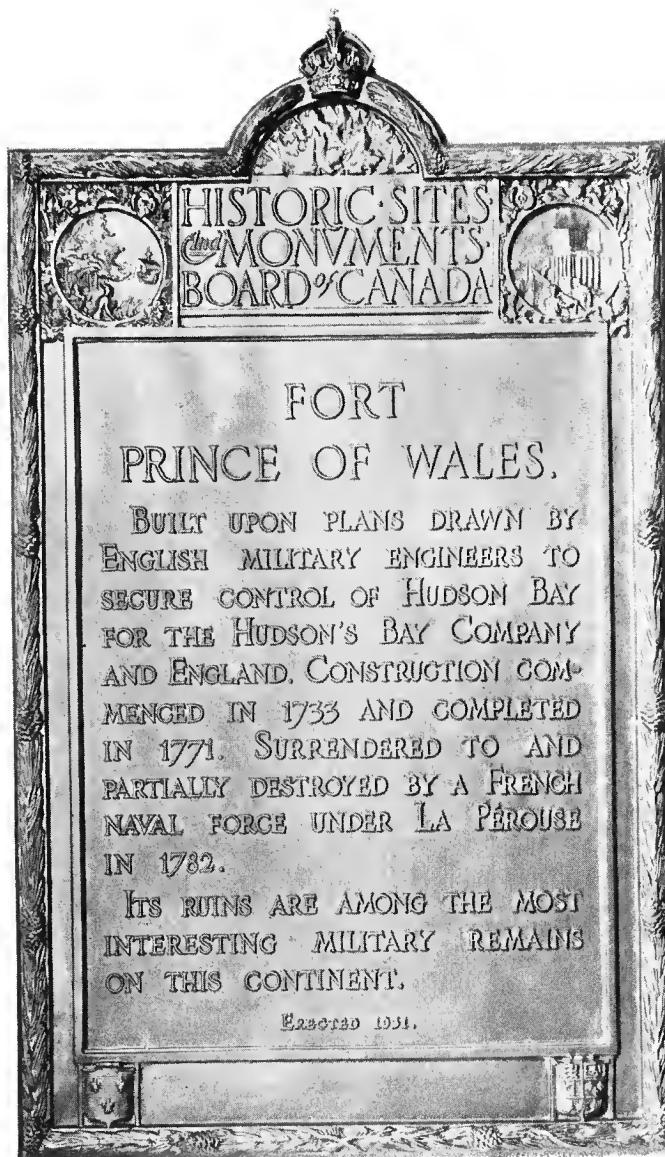
In 1744 Robson was re-employed by the Hudson's Bay Company on a three-year contract to go to York factory. On the way out the ship called at Churchill and Robson took the opportunity to visit the fort. He expresses himself in his book as greatly disappointed with what he saw. Because of faulty workmanship parts of the fort were falling down.

Proceeding to York factory Robson remained there until a letter arrived appointing him surveyor and supervisor of buildings at "Prince Wales fort." Soon after his arrival at Churchill factory he began to correct the faulty methods of construction and found himself in conflict with the governor. Next year, at the termination of his contract, he returned to England.

There is no known plan of the fort to show the finished state nor can the date of completion be definitely fixed, though it is generally given as 1771. Robson gives in his book a plan of the fort, as he knew it in 1747, with only one of the ramparts brought up from twenty-five to forty-two feet in width. The parapet, which was built of timber at first, is shown replaced, along the east side of one curtain wall and bastion, with stone masonry. Evidence that the fort was ultimately completed according to plan may be gathered from the present ruins. A plan of these, published by J. B. Tyrrell in 1900, shows that the ramparts had all been widened and the stone parapet had been completed. The number of embrasures is forty. The number of guns reported by A. Graham, in a letter to the company in 1771, was forty-two. They have all been recovered and are classified as



Aerial View of Fort Prince of Wales, Churchill, Manitoba.



Tablet on Wall of Fort Prince of Wales.

follows: ten 24-pounders, twenty-four 12-pounders, and eight 6-pounders. The magazine was placed in the northwest bastion and the other bastions were finished as store houses.

As a defence against hostile attack the stone fort on Eskimo Point was a complete disappointment. In 1782, on the very first appearance of an attacking force, the fort capitulated. The circumstances were these: The revolting American Colonies had signed a treaty with France in 1778 and in 1782 three ships of war were dispatched from that country under the command of La Pérouse to do what damage they could in Hudson Bay. On August 9th they approached the fort, disembarked a force of 400 men and demanded the surrender of the fortress. Totally unprepared to offer any resistance, Samuel Hearne, the governor, and his garrison of 39 men precipitately surrendered. The captors dismounted the guns, blew up parts of the fortifications, burned the governor's house and sailed away carrying stores and furs as spoils of war, and with the governor a prisoner. La Pérouse then proceeded to York fort where he repeated the success of Churchill river. Soon afterward he sailed home to France with his booty.

Fort Prince of Wales derives its interest as an historical monument from its structure rather than from any memories that cling to it of brave deeds or momentous decisions. It is a well preserved example of European fortification dating back to the eighteenth century. Tradition relates that it was designed by officers who had served under Marlborough. But if that tradition is accepted it does not follow that the fort was a rival to one of the French fortifications in the Low Countries that fell before his victorious army. Compared with any of these it is a small and elementary stronghold. What we have, however, has been preserved undisturbed either by the reconstruction incident to later wars or the pressure of growing towns. Even the attempt of La Pérouse to demolish it was not very effective. He burned the buildings but succeeded in doing very little damage to the masonry of the fort itself.

The outline of the fort is an improvement upon a simple square in that there is a bastion projecting from each of the four corners. This starlike perimeter is enclosed by a heavy masonry wall rising to the height of sixteen feet nine inches above the ground. Back of this wall the rampart, built of earth, provides a raised platform for the guns and is held in place by another masonry wall rising from the ground level inside the

fort. The rampart is from forty-two to thirty-seven feet wide on top and the enclosure inside the fort is about one hundred and thirty feet square. As a protection to the guns and gunners the rampart was surrounded by a low parapet wall, which has suffered somewhat from time as well as the depredations of La Pérouse's men. Two houses once stood inside the fort but they are to-day nothing but heaps of debris. The guns, until quite recently, lay where they were left, spiked and battered, by their captors in 1782.

Fort Prince of Wales and the land immediately surrounding it have been set apart under the jurisdiction of the Parks Branch of the Department of the Interior as an historical monument site. At the instance of the custodians the Department of Railways and Canals has undertaken to carry out a certain amount of restoration work. Timbers have been placed in the gateway to support the falling masonry. The ramparts have been cleared in part of scrub and debris and a length of the rear retaining wall has been rebuilt. Bases have been laid down for a number of the guns and wooden carriages have been built for a few of them. Eventually it is hoped to have the rampart fully restored and all the guns mounted.

When Fort Prince of Wales was being finished a magazine and a battery were built opposite on the east side of the harbour. The magazine was intended to hold the main supply of ammunition for the fort and the battery was to have mounted six 24-pounders. There is no trace of the guns to-day and it seems improbable that they were ever put in position.

After La Pérouse's prisoners had been ransomed from France by the Hudson's Bay Company, Samuel Hearne was sent back to Churchill in 1783. He re-established the factory at the site selected by Knight in 1717 but could not restore Churchill to its former pre-eminence. Its military lustre had become tarnished and as a seat of trade it could no longer compare with York factory. Throughout the nineteenth century it remained what Hearne had left it, an isolated post of the fur trade and the white whale fishery. It was not until almost one hundred and fifty years after the capture of fort Prince of Wales by the French that the departure of the steamers *Farnworth* and *Warkworth* for Europe in 1931 with cargoes of wheat demonstrated the real possibilities of Churchill harbour.

Dobbs and the Northwest Passage

In the year 1733 Arthur Dobbs, an Irishman of influence and ability, visited London and tried to arouse an interest in the neglected Northwest passage. Nothing came of it but on his next visit in 1735 the company acceded to his request to the extent of instructing Richard Norton, the governor of Churchill, who was in England at the time, to send an expedition North. Accordingly in July 1737 two Hudson's Bay sloops left Churchill with a commission to explore Roes Welcome. On the voyage one of the captains died and the sloops returned without accomplishing anything.

Dobbs, concluding that he could make no progress so long as he was dependent upon the company and its servants, now approached the Admiralty and was able to enlist it in the search to which he was so steadfastly committed. Two vessels, the *Furnace*, bonib-ketch, and the *Discovery*, pink, were fitted out by the Admiralty and the command was given to Capt. Christopher Middleton, who had been for some years in the service of the Hudson's Bay Company. The vessels sailed on June 7th, 1741, and entered Churchill harbour on August 8th. They wintered at Sloop cove, the customary wintering place of the company's vessels. On the shore several ring bolts still remain to tell of boats and shipping once tied up here. Upon the smooth surface of the rock may still be traced a few words that were inscribed by adventurers in the middle years of the eighteenth century. The visit of Captain Middleton's expedition is commemorated by the words FURNACE and DISCOVERY 1741 shown in the photograph reproduced on the following page.

On July 1st, 1742, the expedition sailed north. The futility of their quest is shown by a glance at any modern map. Middleton examined every possibility and on his return to England in October reported it as his opinion that all the evidence of the Bay was against the existence of a northwest passage. With this verdict the Admiralty was satisfied but Dobbs refused to accept it. He wrote pamphlets and issued charges against Middleton and the company until at last parliament offered a reward of £20,000 for the discovery of a passage to the Pacific. Thereupon he organized a company and dispatched his own expedition of two vessels the *Dobbs Galley* and the *California*. Sailing from England in 1746 they spent the winter of 1746-47 in Hayes river and the following summer sailed north



Ring Bolt and Inscription, Sloop Cove, Churchill, Manitoba.

to meet with inevitable disappointment. They arrived back in the Thames in October 1747 without mishap, with an abundance of material for publication but without a shred of evidence to sustain Dobb's mistaken hopes of a northwest passage.

In building their forts and setting up their factories the Hudson's Bay Company acted on the assumption that the Indians would travel from their hunting grounds to the factories with their furs and the company would bring merchandise from England to the factories and at this meeting place furs would be bartered for goods. So long as the Hayes, the Albany, the Moose and the Rupert rivers swarmed each spring with Indian canoes there was no occasion to suppose that the stream of inland trade would fail. In that confidence the company was able, for many years, to obtain an ample supply of furs and enjoy a virtual monopoly of the fur trade.

Samuel Hearne

The myth of fabulous mineral wealth only waiting a discoverer was kept alive over a long stretch of years by the occasional exhibition of copper at Churchill. The quantity brought in by the Indians from "the far-away-metal-river" was so great in 1768 that the governor, Moses Norton, urged the company in London to send an exploration party overland to find the river. His motive may have been a mixed one because he knew that whether the explorers found the copper mines or not they would meet distant Indians and open up new sources of furs. His suggestion was received with favour by the company and a commission came out next year to Samuel Hearne to lead the expedition. Hearne had come from England some time before this to serve as midshipman in the company's fleet. On the rock at Sloop cove may still be read the words

Sl. Hearne

July ye 1.1767

probably carved while he was mate of one of the sloops. He took up his new commission and left the fort on November 6th, 1769, with dogs, two white packers and two Indian guides. After about a month of slow travelling the Indians deserted, taking with them the supplies of the white men. They then had no alternative but to retrace their steps to Churchill. A second attempt was made on February 23rd, 1770, but with no better



Inscription, Sloop Cove, Churchill, Manitoba.

sueeess. He reaehed a greater distanee and spent a longer time but had to turn baek after an aecident to his surveying instruments. He reaehed the fort on November 25th.

Norton was determined and Hearne was persistent so on Deember 7th, 1770, he was away again. This time his guide was Matonabee, a famous Chipewayan Chief. But if on this oecasion Hearne's ambition was finally realized it was not beeause his ambition was shared by Matonabee. The chief had his own reasons for making the trip and he saw to it that his own purposes were served at the same time that he assisted Hearne. What these purposes were he did not eonfide to the white man.

Travelling in Indian fashion, with his women to do the heavy work and living off of the country, Matonabee brought Hearne to the mouth of the Coppermine river on July 17th, 1771. On the way they been joined by two hundred Indians. As they embarked in dugouts made by the Indians for the voyage down the river the women had been sent baek to await the return of the warriors. To one who knew Indian ways that was a signal of war. The obejet of their attaek was an Esquimo eneampment at Bloody Falls some miles from the mouth of the river. Helpless alike to warn the Esquimos and to restrain the Indians Hearne was an unwilling witness of the revolting slaughter.

Having made an observation to determine the loeation of the river mouth and the Aretie shore, Hearne took formal posession of the country in the name of the Hudson's Bay Company. Next he visited one of the eopper plaers where he pieked up a pieee of virgin eopper. What he saw eonvined him that there was no profit to be made by working the mine. The return journey took them to the Athabaska country where the winter was spent. Next spring the Indians with their takings of furs turned toward Churehill where they arrived with Hearne on the 30th June, 1772. His reward for settling at last the long debated mystery of "the-far-metal river" was a vote by the London committee of a yearly salary of £130, a present of £200 and a yearly allowanee of £10 for a servant. They also remembered him when Moses Norton died in 1773 and promoted him to the governorship.

Matthew Cocking

An expedition hardly less important for the influence it exereised upon the future poliey of the company was that of Matthew Cocking. At the end of June, 1772, he set out from

York fort with the Assiniboines returning from their annual trip to the Bay. His objective was the country around the South Saskatchewan and the purpose of the journey was to regain some of the trade that had been taken from his company. Leaving their canoes at the forks of the Saskatchewan they marched to the South Branch and after crossing it went on to the Eagle Hills and the Bow river beyond. Here he found the Blackfeet Indians and wintered with them. He found them warlike, great hunters and possessed of a skill in agriculture and handicrafts that raised them far above any other Indian tribe. His efforts to persuade them to go to York fort were fruitless. On May 16th, 1773, Cocking began his return journey. On the way west he had placed agents, bought over from his rivals, to work for the Hudson's Bay Co. at strategic points and now he hoped to gather the fruit of his enterprise. To his disgust the turncoats deserted to their old employers not only with their stock of furs but with everything supplied to them by the Hudson's Bay Company. On top of this disappointment came the transfer to his wily competitors' store rooms of the best of the Indian furs under the persuasive influence of watered brandy. By June 18th Cocking was back at York. His effort was not unrewarded. The same summer he was sent with Samuel Hearne, who had just returned from his famous trip to the Coppermine river, to take charge of the inland trade with headquarters at a spot selected by Hearne and called Cumberland House.

Lord Selkirk

In this tentative manner the Hudson's Bay Company felt its way inland from the Bay toward the western prairies. Shortly after this time the rivalry of the competitors for control of the fur trade was further intensified by the amalgamation of the separate fur trading interests in Montreal. Spurred on by the danger of losing everything, the Hudson's Bay Company pushed further and further inland, out into the prairies and on toward the Rocky Mountains. But the fur traders took little interest either in the fertile prairies or in their possible productiveness. If the agricultural development of the western plains had waited on the initiative of the fur trader it must have been postponed many decades. Into this stagnant pool of inaction a stimulating current was introduced by certain events in Scotland in the early part of the 19th century. Sheep farming

was displacing agriculture on highland estates and homes had to be found for the unwanted labourers. In 1803, many of them had been settled in Prince Edward Island by the efforts of Lord Selkirk. In looking for a place where this enterprise might be repeated Lord Selkirk's attention was directed to the Red River country. It was there that he finally established another of his settlements and thereby became the acknowledged pioneer in colonizing the country now known as the Canadian West.

Selkirk endeavoured to assure the success of his enterprise by the purchase of Hudson's Bay Company stock and the acquisition from that company of an extensive tract of land on the Red and Assiniboine Rivers. He found, however, that he had to meet the constant apathy of the officials and in addition the active opposition of the whole organization of the powerful Northwest Company, with headquarters in Montreal. The first group of settlers arrived at York factory near the end of September, 1811, too late to proceed up the Hayes river to the point selected for a winter encampment. York factory could not accommodate them so an encampment was built on the north shore of the Nelson twenty-three miles from York factory. There the winter was spent. Next year they arrived at the Red river in August and were reinforced the same autumn by another party. In 1813 a third party of settlers, through the obstinacy of the captain, were disembarked at Port Churchill instead of at York factory. Typhoid fever had broken out on the voyage and thirty of the survivors were ill and helpless. At a spot fifteen miles up the river a camp was built on what was called Colony creek. In spite of the discomfort experienced during the winter the health of the immigrants was better than might have been expected. In April the more robust of the men and women journeyed overland to York factory. On the way a daughter was born to the wife of one of the colonists, mother and child surviving the journey. As soon as the ice had gone out of the Hayes river they proceeded to the Red river. Those who had been left at Colony creek followed at a later date.

Friction between the Northwest Company and those in charge of Selkirk's colonists culminated, early in 1815, in an attack upon the settlement, in which crops were trampled down, buildings burned, colonists persuaded to leave and the rest driven away. Reinforcements arrived soon afterward and the loyal settlers returned to their land to plant crops and rebuild their houses. The same season a fourth party sailed from Scotland,

arrived at York factory on August 27th, and reached the settlement on November 3rd to share in the general rejoicing over a plentiful harvest. This was the last expedition to arrive under Lord Selkirk's supervision.

The contest between the opposing parties increased in bitterness until in 1816 a collision occurred between Selkirk's forces and armed half breeds—who were encouraged by the North Westers—in which twenty-one of the former were killed at Seven Oaks. The contest was finally brought to a close by a coalition between the Hudson's Bay Company and the Northwest Company in 1821. Selkirk died in 1820. The lands of the colony remained in the hands of the Selkirk family until 1834 when they were conveyed to the Hudson's Bay Company for company stock valued at £15,000. From that time until 1870, when the whole of Hudson's Bay Territory was purchased by the Canadian Government for £300,000, the history of the settlement was one of rapidly growing prosperity.

Sir John Franklin

One more chain of events should be mentioned at this point as inextricably linked with the Hudson's Bay Company itself, and with the country in which the Company operated. In 1819 the British Admiralty equipped an expedition for scientific work and exploration along the Arctic coast of North America but decided against sending it by ship into the Arctic ice. The expedition was to go overland from a point on Hudson Bay. The officer commanding was Lieut. Franklin of the navy. The British Admiralty was not familiar with conditions under which the expedition would have to travel and consequently counted upon help from the Hudson's Bay Company to smooth out any difficulties that might arise. The expedition left York factory on September 9th, 1819, and arrived at Cumberland House, some forty miles west of The Pas, on October 22nd, where it passed the winter. Delays occurred due to the failure of supplies promised both by the Northwest and the Hudson's Bay Companies. At that time the rivalry between the two companies was at its height and the posts on which Franklin had to depend for assistance were bare of supplies. After much loss of time they reached the Coppermine river with inadequate supplies and only completed the three hundred and thirty miles down stream to the sea in June, 1821. Here a survey was made to the eastward of some five hundred and fifty miles of the coast. It was found

that the position heretofore assigned to the mouth of the Coppermine was four degrees too far to the north. Returning across the Barren Lands, food and ammunition ran short and half of the expedition perished of famine or exposure. The survivors reached York in June, 1822. The misfortune that befell this expedition did much to impress the general public with a most unfavourable opinion of all the Northwest Territories.

Franklin, now promoted to the rank of captain, led a second expedition to the north in the year 1825. This time he descended the Maekenzie river and explored the Arctic coast eastward from the Maekenzie to the Coppermine and westward from the Maekenzie for a distance of three hundred and seventy-four miles. On his return to England he was knighted by the British government in recognition of his explorations.

A third expedition of Arctic exploration was sent out by the Admiralty in 1845. This time it was to go by sea. The command was given to Sir John Franklin and he sailed with two well equipped ships, the *Erebus* and the *Terror*. None of the party ever returned. The numerous expeditions that were sent out to search for the missing ships and crews established by their discoveries the main features of the tragedy. These are that the ships were beset by the ice in 1846; Franklin died in 1847; the ships were abandoned in 1848, and the crews reached King William Island. Thence the party set out for the mainland but, according to the report received from the Esquimos, they all perished on the way. Thus the name of Sir John Franklin was indelibly written on the page of Arctic exploration.

Later History (1886-1935)

RAILWAY TO PORT NELSON AND DEVELOPMENT OF PORT

With the growth of population in the West and the consequent increase of agricultural production, a need for larger markets began to be felt. The most attractive market from the standpoint of size and reliability was, of course, the European market. This, however, was difficult of access because of lack of railways. To render it more accessible was the main objective of Canadian enterprise, not only in railway extension but also in waterway improvement. It was early recognized that there were advantages to be secured, both from the standpoint of construction and operation, in building a short line to the sea. The

shortest route from the West to the sea, as the map plainly showed, must lead to Hudson Bay. And so, as long ago as the eighties, there had been talk of building a railway to a port on the shores of Hudson Bay. The project was viewed with such favour by the federal government that it made a standing offer, from the year 1886 to the year 1908, of a land grant to anyone who would build a railway to the Bay from the West. This offer was taken up in part by the Canadian Northern Railway Co. in constructing a line from Hudson Bay Junction to The Pas. This land grant provision was withdrawn in 1908 and the Department of Railways and Canals appointed an engineer of its own to organize surveys and report on the cost of a railway from The Pas to Hudson Bay. Funds to pay for the undertaking were to come from the sale of public lands in the West. The legislation under which these funds were to be earmarked for the railway remained in force until 1918 and provided approximately twenty-two million dollars. This revenue was never set apart specifically for the purpose of the railway but the public treasury has had the use of it. In anticipation of the settlement of Churchill the Department of the Interior made surveys at that point in 1908 which included the laying out of a townsite.

On September 9th, 1909, Wm. Beech was granted a homestead in Churchill townsite, consisting of a rectangle enclosing forty blocks, with the included streets. This parcel measured 2,783·5 feet by 2,760 feet, with an area of 176 acres and containing 800 lots. At the same time C. E. Beech had purchased two parcels, one measuring 2,783·5 by 980 feet with an area of 62·5 acres and containing 300 lots and the other irregular in shape with an area of about 63·5 acres and containing about 300 lots. The total of the above three parcels was therefore about 302 acres distributed over 1,400 lots. These parcels were situated to the southwest of Lake Rosabella and were bounded on the southeast, in part, by thirty-seventh avenue, which was the southeasterly limit of Churchill townsite. Wm. Beech completed his homestead duties and in the course of time sold a number of these lots, but after work was started at Port Nelson the interest in Churchill lots declined.

In his preliminary report of February 1909, the engineer mentions two possible terminals on the Bay, viz., Churchill and Port Nelson. The estimates for the construction of a railway to each of these points, along with the necessary harbour works, for each, showed a difference of about four million dollars in

favour of Port Nelson. In August surveys had been completed of both Fort Nelson and Churchill harbours. From these surveys it appeared, in the opinion of the Chief Engineer of the Department, that Port Nelson was more suitable than Churchill. In the same year, 1909, railway location surveys were begun. In 1910, the contract was let for the bridge over the Saskatchewan river at The Pas. In 1911 the contract for the first 185 miles of grading was let. In the following year it was pointed out that the additional mileage to Churchill weighed heavily against it as a terminal. Later in the same year the final decision to carry the line to Port Nelson was made and contracts for grading the remaining 239 miles to that point were let.

In view of the subsequent reversal of this decision and the adoption of Churchill as the terminal point, it may be asked why the first decision was ever made. Had all been known then that is known now it would not have been made. At four points difficulties presented themselves, which, when viewed in the light of the available data, appeared unsurmountable. In the first place a section of track seventy-five miles in length at the Churchill end had to be located over frozen muskeg. This foundation, it was feared, would soften under the summer sun and absorb the roadbed. By 1927, however, it had been found that a substantial gravel fill on top of the muskeg acted as a heat insulator and so prevented the foundation from giving way. This principle has now been fully tested and verified by experience with the railway as actually constructed through this country. In the second place, every indication, apart from actual test boring, pointed to the presence of solid rock in large quantity in the harbour bottom at Churchill. The cost of the necessary dredging, if that were true, would have been excessive, if not prohibitive. It was only by means of test borings, carried out during the winter of 1926-27 with a well drill transported to Churchill by airplane, that this difficulty was finally disposed of. An area in the harbour was explored through the ice and found free from rock. The third difficulty arose from the limited area in the harbour for mooring ships. With the channel and deep water wharf as now established at Churchill the need for moorings in the harbour has not arisen. If it should arise at a future date the present deep water area may be enlarged by dredging so as to provide this accommodation on an equality with anything contemplated for Port Nelson, at moderate cost. In the fourth place the mean annual temperature is decidedly

lower at Churchill than at Port Nelson. This disability still remains.

In anticipation of the choice of Port Nelson as the terminus, an engineer had been sent to the mouth of the Nelson to recommend a site for the town and in 1911 the Naval Service had begun a hydrographic survey of the Nelson estuary. In the parliamentary session of 1911-12 the boundaries of Manitoba were extended northward to latitude 60° and northeasterly to longitude 89° on the Bay. Both Churchill and Port Nelson were thus placed within the confines of the province of Manitoba. In 1912 an engineering party went overland to Port Nelson to prepare for construction operations. Finally, in 1913, as soon as the season was sufficiently advanced, ships sailed from Halifax with stores and construction materials for use in building operations at Fort Nelson. The construction work at this point was pushed forward energetically year by year until, on account of the war and the consequent shortage of ships to bring in materials and supplies, the work came to a standstill and at the end of 1918 the work at the terminus was closed down. The work completed thus far, in addition to the assembling of plant and the building of a camp, consisted of the partial completion of an artificial island adjacent to the proposed ship channel and the construction of a steel bridge two-thirds of a mile long from the island to the main land.

During these years the construction of the railway went steadily forward. By the end of 1918 the right of way had been cleared and graded all the way to Port Nelson, steel bridges had been erected at the first crossing of the Nelson river at Manitou Rapids and the second crossing at Kettle Rapids and track had been laid as far as the latter bridge. The completed portion was only operated as far as mile 214 from The Pas and over this portion only a very limited service was supplied. Very little money was spent for maintenance.

It was not until 1926 that the work of completing the Hudson Bay Railway was actively resumed by the Department of Railways and Canals. During the eight-year interval between the closing down of the work and the resumption of construction much that had gone into the line was destroyed by natural agencies. The ties had rotted and required replacing, embankments had settled, the frost of succeeding winters had caused extensive damage. To operate trains over the track in that condition was unsafe if not impossible, consequently as a prelimin-

ary to any further construction the rehabilitation of the entire trackage as formerly finished had to be undertaken. The Department of Railways and Canals authorized the Canadian National Railway to act as its agent in the matter and the work of reconstruction was carried out by the construction forces of the railway. The Department also authorized the Canadian National Railway to complete the line to Churchill.

In the interval since the suspension of construction in 1918, however, a new condition had arisen, due to the recommendation of a special committee of the Senate in 1920 that before further important expenditures be made upon the line to Port Nelson a new and exhaustive examination should be made of the relative merits of Port Nelson and Churchill. To meet this situation the Department decided to call in an unbiased consultant. The engineer selected to make the inquiry was Mr. (afterwards Sir) Frederick Palmer of London, England, an eminent authority on port construction, since deceased.

RAILWAY TO CHURCHILL AND DEVELOPMENT OF PORT

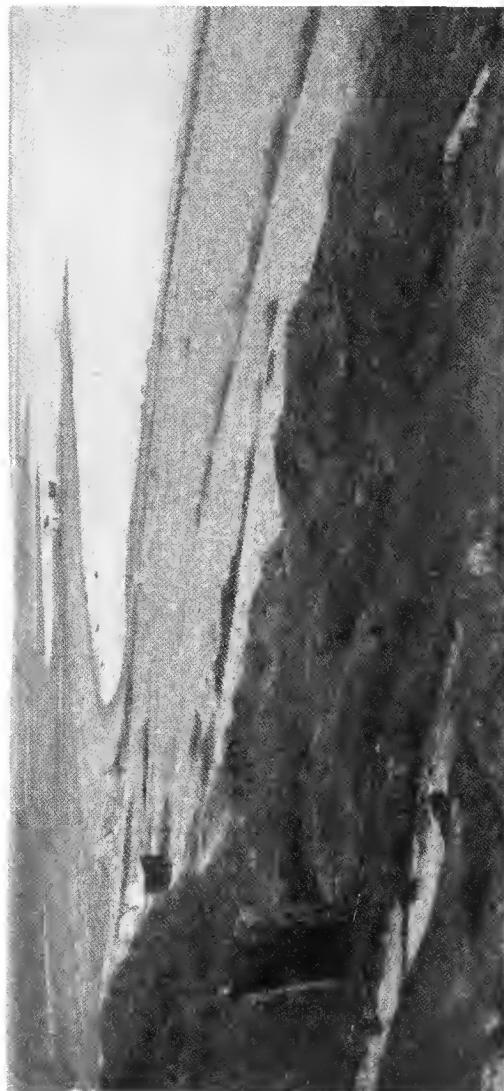
In August 1927 Mr. Palmer, together with the Minister of Railways and Canals and the chief officials of the Department, visited both places. As a result of his investigations Mr. Palmer recommended the abandonment of Port Nelson and the selection of Churchill as the terminus. In support of that recommendation he pointed out that: (A) It was possible to make a better harbour at Churchill than at Port Nelson, in that any harbour that might be constructed at Port Nelson could only be entered at high tide and even then it would not admit ships of more than 26 feet draft, whereas there would be no difficulty at Churchill in making provision for ships of 30 feet draft at every stage of the tide; (B) The cost would be less at Churchill than the cost of completing the work at Port Nelson; (C) The time required to complete the work at Churchill would be three years less than the time required at Port Nelson. Acting on this expert advice, work was immediately begun on transferring plant and supplies from Port Nelson to Churchill. This was done by scow and tug during the season of navigation and by tractor up the coast the following spring. By this means supplies were landed in Churchill before the arrival of ships late in the following summer. In no other way could a camp have been made ready and a wharf

been built in time to receive the incoming cargoes when the ships arrived in 1928.

As soon as a decision was reached to make Churchill the terminus instead of Port Nelson the Department of Railways and Canals, with a view to preventing speculation in lots and to avoid the premature influx of settlers, instituted expropriation proceedings against Wm. and C. E. Beech. The notice of expropriation was filed in the Neepawa land office by the Department of Railways and Canals on August 15th, 1927. In order to determine a fair price to be paid by the department to the heirs of Wm. Beech for their holdings in this area a test case was submitted to the Exchequer Court. By a judgment of March 24th, 1930, an award was made to the heirs of \$30 per lot plus interest at 5 per cent from August 15th, 1927, to March 24th, 1930, and they were allowed their costs. Those persons who had acquired portions of the original Beech subdivision but did not come under the terms of the award were dealt with by Order in Council No. 3011 dated December 24th, 1930, which authorized the Department to pay them \$30 per lot plus interest from August 15th, 1927, to the date of payment.

In relocating the railway between mile 332 and Churchill the most economical route to follow was found to be by the Port Nelson line as far as mile 356 and at that point to begin the new location to Churchill. By April 1st, 1929, steel had been laid all the way to Churchill. The last sixty miles, however, had been laid on frozen ground and swamp without any ballast. As had been foreseen this portion of the line could not be used after the thaw at the end of May. In the interval, however, it was possible to get a quantity of supplies over it to Churchill including railway equipment for ballasting operations at the Churchill end. Ballasting was then carried on simultaneously from both ends and from an intermediate point, and was completed by September 14th, in time to allow of the transportation of timber and other supplies to Churchill before winter set in. The presence of the railway in Churchill not only greatly simplified the problem of securing adequate supplies but also provided a means of hastening grading and filling operations at that point.

From the time of Munck onward those who established themselves on the Churchill river chose the West side of the harbour. On that side the Hudson's Bay Company built its first and second posts and on that side later built fort Prince of Wales. On



Site of Wharf, Churchill, Manitoba, as it appeared in 1927.



Churchill in 1934.

September 2nd, 1906, a detachment of the North West Mounted Police went to Churchill and after erecting the necessary buildings established a post as headquarters of M Division on the West peninsula about one mile above fort Prince of Wales. But when the time came to choose the site for a terminus at Churchill, including a railway yard, a townsite and a deep water wharf, it was seen that the East peninsula was the most suitable place to put it. Not only would a wharf have been more exposed to storms and a townsite more restricted on the West than on the East peninsula, but the necessity of building a bridge to carry the railway across the river would entail a heavy expenditure without providing any compensating advantages.

The season of 1928 was an extremely busy one at Churchill. No sooner had a temporary wharf been built and a few buildings erected with materials brought from Port Nelson than ships began to arrive with timber, coal and other supplies. These were unloaded into scows and lighters from their anchorages in the river. At the wharf the coal and supplies were unloaded into narrow gauge railway cars and carried to coal pile or storehouse. The chief concern during 1928 and 1929 was erecting buildings, installing machinery, accumulating supplies and assembling dredging plant. The dredging plant consisted of two eight yard dipper dredges, two hopper barges, two tugs, three dump scows and motor boats. During 1929 some 470,000 cubic yards of preliminary dredging was done and nearly 1,700 linear feet of shallow cribs were placed in the rear wall of the wharf and were filled. At the close of that year everything was in readiness to proceed with the main features of the project.

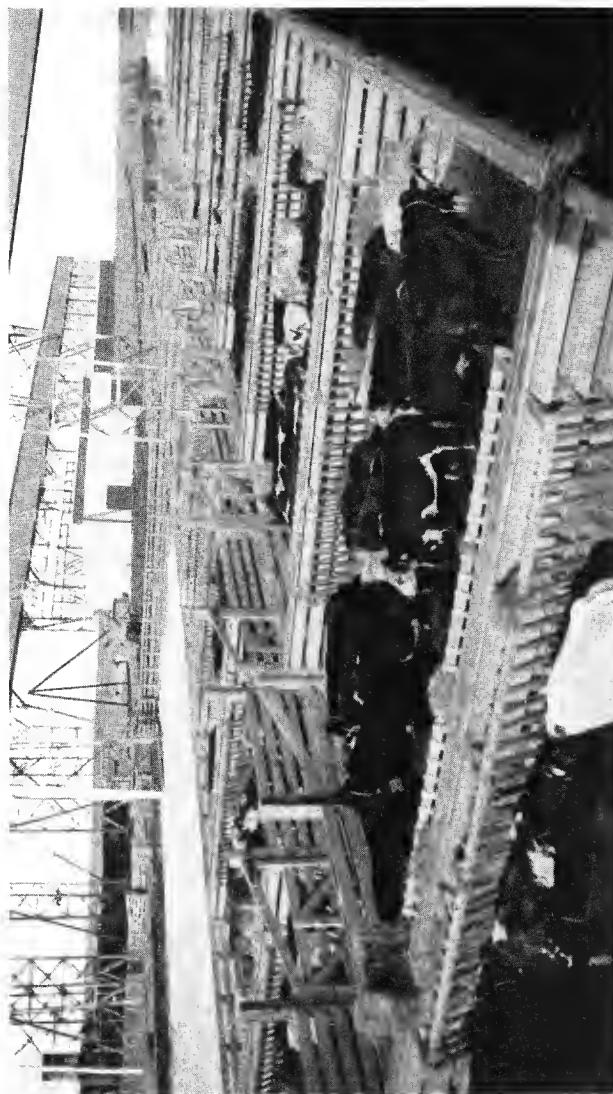
Among the supplies taken to Churchill by ship in 1928 were the instruments, masts, and equipment for a wireless station. A building was erected on the high land near the Bay and the wireless apparatus was set up the same season. Through this station the construction force was enabled to keep in close touch with Ottawa for consultation, to report progress and to order supplies as required. In 1929 and subsequent years the station assumed the additional duties of direction finding for the benefit of vessels approaching or leaving the port.

As a natural haven from storms Churchill harbour did not need improving. From whatever quarter the wind may blow the rocky shores beat off the roughest seas. This is true even for a wind that blows straight through the entrance, for the passage is

narrow and the harbour channel turns sharply after the entrance is passed. Anchorage is available inside up to thirty-five feet in depth at low tide. The tidal range for spring tides is from 14 to 16 feet. So long as the number of ships to enter the harbour was not large they could be assured of good accommodation in the natural condition of the harbour. To change the haven into a port it was necessary to build a permanent wharf and dig an approach channel. The most suitable location for the wharf was seen to be on the east side of the harbour about one mile inside the entrance, at the low water mark. Although the shores are rocky it was found by the comprehensive borings previously referred to that the channel and wharf could be so located that no rock would be encountered at less than thirty feet below low water level. The expense of dredging in rock was therefore avoided. The two purposes of the dredging were first to prepare a seat for the deep water cribs at the face of the wharf and second to excavate a ship channel from the wharf to the deep water near the mouth of the harbour.

Wharf, Shed and Dredging

The cribs that form the face of the main wharf were built during 1930 and 1931. They all rest on a crib seat thirty-two feet below low water mark, except one where rock was encountered. The material used in their construction was 12-inch by 12-inch Douglas fir. All the face timbers above low water mark were creosoted. Each of these cribs was built up to the seventeenth course in shallow water and then moved to deep water where it was built up to the thirty-sixth course. It was then sunk in position on the crib seat by heavy concrete blocks. These blocks were removed after a dredge had partially filled the crib so as to hold it down. Additional courses of timber were then added until the top reached elevation 23, at a height of 55 feet above the bottom of the crib. Most of these cribs are one hundred and fifty-four feet long, all are forty-nine feet wide at the base and all have a batter at the face of one in twelve. At about the low water mark they a step at the rear of eighteen feet. The rear cribs, which were put in place in 1929, rest on the natural bottom, are vertical back and front and are either twenty-four or thirty-two feet wide. After all the front and rear cribs were in place, a row was built across the lower end and the enclosed area was filled with gravel. The amount of timber



Cattle Pens, Churchill, Manitoba.

used in these cribs was 11,800,000 ft. b.m. and the amount of filling, whether in the cribs or in the enclosed area, including dredged material, was about 500,000 cubic yards. The crib work, like the dredging was done by employees of the Department of Railways and Canals. The deep water wharf as thus built measures 1,856 feet long at the face, 250 feet wide for a length of 500 feet at the lower end and 300 feet wide for the rest of the distance. A timber trestle has been built near the upper end of the wharf to accommodate a locomotive crane for use in unloading coal from ships. From the lower end of this trestle a standard gauge railway track extends along the front of the wharf to the lower end. Nineteen mooring posts have been distributed along the front of the wharf.

In 1932 a one-storey freight shed, 303 feet long and 173 feet wide was put upon the wharf twenty-two feet from the face and 800 feet from the upper end. In 1935 the shed was extended at the north end so that the dimensions now are 477 feet by 173 feet. The material is structural steel with timber floor and tar and gravel roof. The wharf has been planked in front of the shed. Inside the shed at the back the standard gauge railway runs the full length of the building to accommodate cars for the delivery and receipt of freight. To the rear of the shed a roadway has been laid down to accommodate trucks and tractors. The shed has now been in use for seven seasons and has proved its usefulness for handling inbound and outbound cargo. Near the shed a pair of sheer legs, capable of lifting thirty-five tons, has been erected for handling heavy packages.

Provision has been made for unloading cattle from railway cars and caring for them until they have been put on board ship. There are twenty pens for this purpose with a total capacity of four hundred full grown cattle or about twenty carloads. The track from which they are unloaded is an extension to the coal track at the elevator power house. In each pen there are two hay racks and a water trough for the use of the cattle. Provision is made for inspection by an official. From the pens a runway, just to the north of the cross conveyer gallery, extends to the face of the wharf.

One of the two dredges was kept busy during the years 1930 and 1931 digging crib seats, assisting in the sinking of cribs and casting material into the cribs after they had been sunk. The other dredge, during these years, was occupied in dredging the

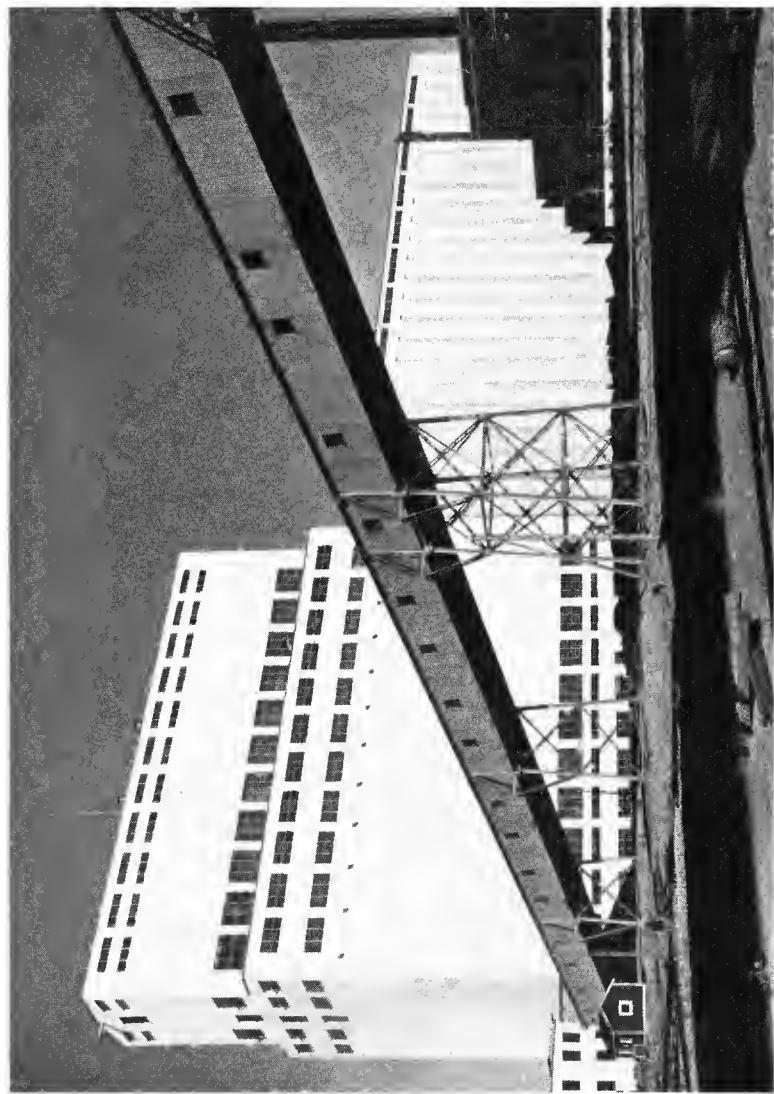
ship channel. After the cribs had all been placed, as there was not room in the ship channel for both dredges to work together advantageously, one of them was laid up during 1932 and was towed out by sea in 1933 to be transferred to the Department of Marine. By the end of 1936 a total of 2,348,600 cubic yards had been dredged. Some of this excavation had been used for crib filling but most of it had been carried out into the Bay and dumped there. The channel formed by the dredging measures from 600 feet wide in front of the wharf and 400 feet wide at the lower end near the harbour mouth. The depth to which it was dug is thirty feet below the level of low tide. It has been observed that silting occurs each year in the lower end of the channel to such an extent that a depth of twenty-six feet at low water can only be maintained in the future by carrying out an annual program of dredging.

When the dredges were sent into Churchill in 1929 it was realized that the beach was not a satisfactory place to store the dredging plant during the winter months. A marine slipway was therefore ordered for delivery at Churchill. All the material and machinery was sent to Churchill in the spring of 1930 but on account of other work of importance it was not until the summer of 1932 that the erection could be undertaken.

The slipway is of the three-track type and is capable of hauling up a vessel of 1,200 tons displacement of the flat bottom type, like a dredge, with about a third of the weight on each track, and is also capable of hauling up a keel vessel of 800 tons displacement with nearly all the weight on the middle track. The overall length of the cradle is 187 feet with a length over keel blocks of 172 feet. The clear width between side uprights is 46 feet. The place chosen for the location is the point of land a short distance below the main wharf.

Elevator and Power House

The first landmark to be seen from a ship as she approaches Churchill—and no other feature in the landscape can dispute its dominance—is the two and a half million bushel grain elevator. In no less decisive fashion the business that centres in the elevator occupies the chief position among the revenue producing activities of the port. That this would be so was realized when the elevator was designed and consequently care was taken that



Grain Elevator, Churchill, Manitoba.

it should embody the latest ideas in construction and equipment. In view of the possibility of greater future business than was visible at the initial stage, the elevator may be conveniently enlarged up to an ultimate capacity of 10,000,000 bushels.

The location of the elevator is such that the fronts of the buildings are parallel to the face of the wharf and the front of the storage annex is 600 feet back from it. The foundations are supported on piles and the buildings are of reinforced concrete construction. The main group of buildings includes an office, track shed, workhouse, drying and cleaning plants and storage annex. The storage capacity of the workhouse is 500,000 bushels and that of the annex is 2,000,000 bushels. A separate building nearby contains the power plant for the generation of electric power and on the wharf there is a pump-house, auxiliary to the power-house. The three generators in the power-house have a combined capacity of 3600 K.W.

The electric generators of the power-house are driven by condensing steam turbines. The exhaust steam passes to condensers cooled by salt water from the harbour. The necessary water is supplied by pumps capable of delivering 4,800 gallons of water per minute, set up in the pump-house on the wharf. The intake well in the wharf for these pumps, as originally planned, was protected from trash by a fixed screen. But so great was the amount of floating vegetable matter in the water that the screen quickly became clogged and the water was cut off. To meet this difficulty a travelling screen was installed, with jets of water playing upon the back so as to clean off the debris. This arrangement has proved entirely satisfactory.

Loaded grain cars are emptied, after arrival at the elevator, by four car unloaders in the track shed, each capable of emptying eight cars, about 10,000 bushels, per hour, under conditions of maximum performance. After the grain has been elevated it can be delivered to the deep-water wharf by a four-belt conveyer system which runs in a gallery. The shipping gallery in its 1,462 feet of length, provides berths at the wharf for three ships at one time under the gallery spouts. Twenty-three boat spouts about sixty-five feet apart make it possible to discharge four streams into ships at the rate of 20,000 bushels an hour for each stream.

The elevator power-house and gallery with all the operating machinery and power-house equipment were built and supplied by contract. The foundations were begun in 1930 and the build-

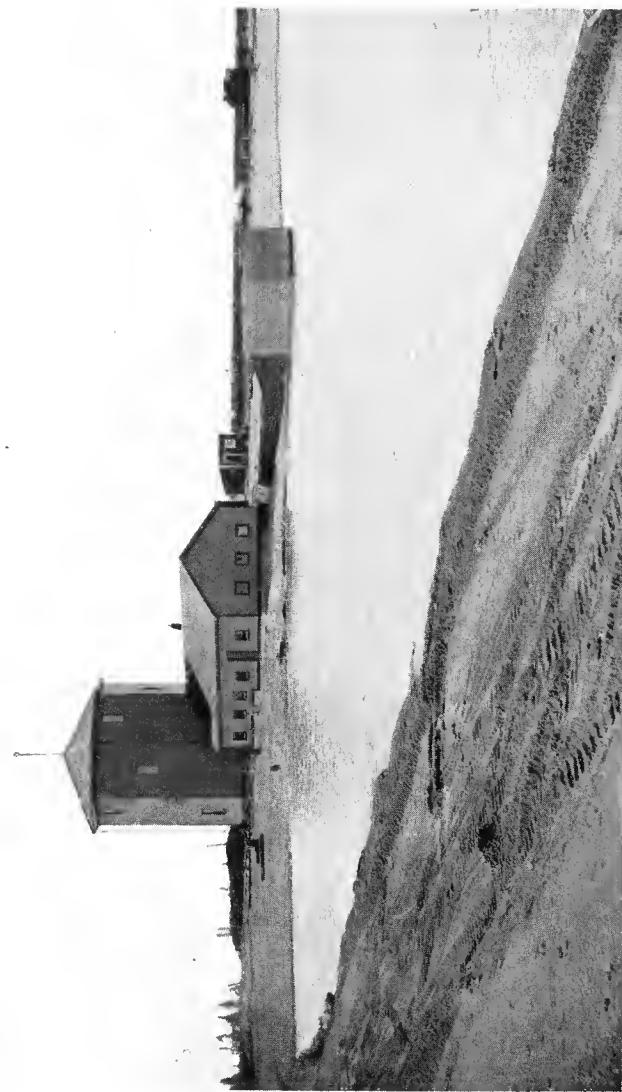
ings and equipment were complete by September, 1931, with the exception of 1,137 feet of conveyer gallery. The construction of this section had to be assigned to the following year because the portion of the wharf on which it was to stand could not be made ready to receive it sooner. From the completed portion of the gallery two ships, the *Farnworth* and the *Warkworth*, were loaded with grain in 1931.

Water Supply

When the Department of Railways and Canals acquired the necessary lands for the construction of the port it was noticed that at a distance of about four miles from the mouth of the harbour, there were a number of small lakes. The quality of the water, as determined by analysis, was found to be excellent. In order to preserve this source of supply for future use and protect it from contamination an area of about two and one-half square miles surrounding it was set apart as a water supply reservation on which settlement is prohibited. It is here that the reservoir is located.

The laying of the water main to supply the camp with fresh water was begun in 1930. Although the main, like the reservoir to serve it, was not finally finished until 1934, yet by means of a temporary extension and a provisional source of supply the system was made to furnish all the water required after 1931.

In designing the water supply system for Churchill it was decided to install two 60,000 gallon tanks, one near the reservoir and the other on the high land near the Bay directly opposite the Canadian National Railway tank. The latter tank is entirely dependent upon the Department for water. Its requirements are met from the nearer tank, known as the town tank, by gravity. In the same way the town tank supplies the needs of the wharf, power-house and camp. Adjoining the town tank there is a pump-house in which an electrically driven centrifugal pump (and a spare), is to be installed for use in certain circumstances. Conditions at the reservoir call for a larger pump-house than the one at the town tank. The main pump in this installation is a centrifugal pump of four hundred gallons per minute capacity which is driven by a 35-horsepower diesel engine and besides this there is a reciprocating steam pump of the same capacity as a spare. Either of these pumps may be used to draw water from the reservoir and supply the pipe line directly;



Tank, Pumphouse and Part of Reservoir, Churchill, Manitoba.

they may also pump into the tank. If the tank is used to supply the pipe line one of the pumps must provide the necessary pressure. For several years the steam pump had been set up at lake Rosabella in a provisional pump-house to supply the camp from that source. In October, 1934, it was moved to the reservoir pump-house where it was permanently installed and water was supplied to the camp from this source.

At Churchill, since the ground is frozen all the year round, the usual practice of sinking the water pipes underground as a protection from frost could not be followed. The pipes are therefore kept from contact with the ground by supporting them about one foot above the surface on timber posts. The posts were placed in holes ten feet apart which had been drilled in the frozen ground with a well drill. The water main between the reservoir and the town tank is ten inches in diameter and 14,487 feet in length; the branches from the town tank to the elevator power-house and the C.N.R. tank are eight inches in diameter and the former is 4,940 feet long and the latter is 2,212 feet long. As a protection against frost, the main pipe and part of the branch to the elevator power-house was covered to a depth of four feet with moss; the rest of this branch, for a length of about 2,000 feet where it crosses the slough to the east of the elevator was put in a cedar box with provision for heating with steam pipes; the branch to the C.N.R. tank was put in a similar heated box but of heavier construction. The main to the town tank, the branch to the C.N.R. tank and part of the branch to the elevator power-house were finished in 1931. It was possible therefore, as already mentioned, by using a stretch of temporary pipe, to have the use of lake Rosabella water each summer at the camp and elevator.

The site selected for the reservoir was a small lake about a quarter of a mile south-east of lake Rosabella. A portion of the lake measuring 200 by 500 feet was drained and excavated by dragline to a depth of twenty feet. In 1930, the first year of work, 60,015 cubic yards was excavated and in 1931 the quantity was 42,800 cubic yards. The material was clay. To obviate the inconvenience of muddy water the bottom and sides of the reservoir were covered with gravel in 1933. As a further improvement ditches and dykes were built in 1934 to conduct the best water to the reservoir and keep away water darkened by muskeg. As completed in 1934 the reservoir has a capacity of about 20,000,000 gallons.

In 1933 intake works were built at the reservoir and in 1934 the pumps were connected up. Near the close of the year all details of the system had been completed and water was pumped regularly from the reservoir to the tanks and the camp.

A system of fire protection has been installed on the wharf for use in case of an outbreak of fire in the shed or among cargo piled on the wharf. The pressure for this service is furnished by two electrically driven centrifugal pumps which have been installed for that purpose in the elevator pump house on the wharf. The water for this service is supplied by an eight inch continuation of the branch to the elevator powerhouse which is also carried along the wharf to the shed and then inside the shed throughout its length. Hose connections are provided at intervals for use in case of fire.

Ice Surveys

The sea-going tug *Ocean Eagle*, which is stationed at Churchill, has been strengthened to meet ice and is equipped for salvage operations. She first arrived at Churchill in 1928 with the dredge *Churchill No. 1* in tow from Montreal. In 1929 she towed the tug *Graham Bell* from Quebec to Churchill. In subsequent years she had made trips into the Bay on ice patrol to trace the opening up of the ice and ascertain the date on which the steamship lane was free from ice between Churchill and the western end of Hudson Strait.

In 1930 the ice went out of Churchill harbour on June 6th. The ice hung near the shore until about July 1st. On that date the *Ocean Eagle* went out and followed the line of ice, about ninety miles off shore, to Latitude 62° where heavy ice was met and she turned back to Churchill. On the second trip, July 10th to 18th, she found ice northeast and east of Cape Churchill but open water beyond. Heavy ice was met about the centre of the Bay. On the third trip, August 3rd to 11th, no ice was seen all the way to the north of Mansel Island.

In 1931 the ice went out of the harbour on June 11th. On the first trip into the Bay July 3rd to 13th, the *Ocean Eagle* got around the ice about one hundred miles north of Churchill, crossed the Bay, passing through occasional patches of ice, found the channel between Coats and Mansel islands full of heavy ice and got as far as Nottingham island. On the second trip, September 19th to October 5th, a study was made of the Foxe Channel ice. The first ice seen was lying near Coats island on September 21st.

East of Bell peninsula a field was skirted on the 22nd. On the 23rd heavy ice was met north of latitude 65 extending east and west. Returning to the same latitude on the 29th large bodies of moving ice were encountered. This ice was moving south along Bell peninsula and southwest along Coats island. On October 3rd, after an easterly gale, ice was observed moving southwest from Bell peninsula. After this, a trip was made to Fisher Strait, October 6th to 14th, to observe the currents. Very stormy weather was met with on this trip. From the observations it was possible to make, the prevailing current near Coats island appeared to be to the southwest.

In 1932 the ice went out of Churchill harbour on June 7th. On June 24th the *Ocean Eagle* found very heavy unbroken ice a few miles from shore. From June 29th to July 4th loose ice was met about 40 miles off shore and heavy ice about 60 miles. On the next trip, July 8th to 21st, the *Ocean Eagle* found heavy ice at a radius of about 60 miles from Churchill; got round the northerly point about 120 miles north of Churchill and followed the northerly edge to Coats island; found open water between Coats and Mansel islands but heavy ice beyond. On the return trip, following approximately the same course, the ice was found somewhat broken. On August 23rd the *Ocean Eagle* left for Foxe Channel, returning on September 9th. The first ice was met on August 25th to the southeast of Bell peninsula and on the way north several fields of ice were met until, to the south of Spicer islands a heavy field of ice was met which appeared to be the "real Foxe Basin ice." Continuing to the northwest to Latitude $68^{\circ} 10'$ a very heavy floe of rough ice was met with. Turning back, ice was met on the 1st and 2nd, and on the 3rd the ship came to anchor four miles off shore from what appeared to be an island. This land is about thirty miles to the southeast of Spicer islands and is not shown on any chart. An extended exploration was not possible because the coal supply was low, and a closer examination could not be made in the time available because of fog. Returning to Churchill no ice was seen after September 4th.

On June 17th, 1933, the ice went out of Churchill harbour. The ice remained eight to ten miles off the coast until July 8th. On the trip from July 11th to July 24th the *Ocean Eagle* rounded the corner of the ice about 140 miles north of Churchill and followed the ice to Coats island. There it was not possible to pass to the south of the island so she turned back to Churchill. On

the return trip the ice was found to have moved south to some extent. Leaving Churchill again on August 8th ice was met 50 miles northeast of Churchill. Thence sailing nearly 90 miles due north the ice was rounded and left behind. No more was seen of it all the way to Erik Cove. This ice field hung off Churchill for some time, for it was seen on August 18th to the northeast of Churchill from one of the ships inward bound from Hudson Strait.

On June 21st, 1934, the ice went out of Churchill harbour. Ice remained from six to eight miles off shore until July 11th. Going on ice patrol from July 16th to the 28th the *Ocean Eagle* followed the ice in a general northeasterly direction to Fisher Strait, then passed to the south of Coats island and cleared the ice until within thirty miles of Nottingham island, where ice was met. Returning to Churchill on approximately the same course a good deal of ice was seen. The next trip, August 5th to 14th was to Erik Cove and back. Except for a small patch of ice on the 6th no ice was met on this trip.

On June 8th, 1935, the ice went out of Churchill harbour. On July 3rd, the *Ocean Eagle* was outside the harbour for two hours, but could make no progress through the ice in the Bay. On July 7th she was out again on a brief patrol. On July 9th the *Ocean Eagle* found ice eight miles off the coast. The *Ocean Eagle* made the first patrol across the Bay from July 16th to July 28th. On leaving Churchill, heavy ice was found near the shore. Working northward through loose ice a point was reached opposite Cape Eskimo on July 23rd, where the extremity of the ice was cleared. From that position to within about 50 miles of Nottingham, which was reached on July 25th, no ice was encountered. The *McLean* reported no ice around Nottingham. On the return trip, following the steamship lane, no ice was encountered until July 27th. On that date heavy ice was met about 110 miles northeast of Churchill. Steaming around this field of ice, it was found that the north extremity and western edge had moved but slightly since the date of the outward voyage. On the next patrol from August 3rd to August 9th, loose ice was met about 15 miles from Churchill in the steamship lane. This field was lying about 30 miles off the western shore of the Bay, and extended to some 125 miles north of Churchill. The extremity of this ice was passed on August 4th. Thence to Nottingham Island, which was reached on August 6th, only a few pieces of ice were seen. On the return trip there was more open water in the vicinity of

Churchill, but otherwise the extent of the ice field had not changed much. The position and nature of the field on August 9th was such that a tramp steamer could sail around it and enter Churchill with safety.

On June 18th, 1936, the ice went out of Churchill harbour. Leaving Churchill on June 27th, the *Ocean Eagle* encountered ice about 125 miles to the northeast on June 28th. This ice was followed northward until further progress was blocked on June 30th in the vicinity of Marble Island. Returning southward through more or less loose ice, it was found that the ice was about 15 miles off the coast to the south of Cape Churchill, but that the mouth of the Nelson river was still frozen. She then turned northward and docked at Churchill on July 5th. On the next trip, from July 16th to July 26th, loose ice was met about 80 miles to the northeast, and close packed ice 210 miles to the northeast on July 17th. The point of this ice was rounded on July 18th at about the latitude of the southern extremity of Coats Island. It was impossible to pass to the south of Coats Island because of heavy close packed ice. Returning on a course to the north of the steamship lane, ice was left behind about half way to Churchill. On the third trip, August 2nd to August 9th, it was found that the ice had moved southward some 50 miles and was broken and loose. Continuing to Nottingham Island and Erik Cove, the pack was found to be to the southeast of Nottingham Island on August 5th. On the return trip no ice was met, though a small patch was sighted about 200 miles northeast of Churchill.

On May 27th, 1937, the ice went out of Churchill harbour. There was no ice in the harbour to interfere with dredging after June 3rd. Leaving Churchill on July 9th the *Ocean Eagle* encountered the ice pack about twenty-one miles out on the steamer lane; this ice was followed westward to Hubbard's Point and eastward to Nelson Shoal; further progress was blocked and the ship returned to Churchill. On the second patrol July 16th to July 24th, the *Ocean Eagle* met the main body of ice about eighteen miles out on the steamer lane, following a northward course between the ice and the shore a passage was found to Nottingham Island, returning to Churchill along a similar course the pack was found to be about fifty miles wide and seemed to be drifting south eastward along the shore. On the third trip August 2nd to August 4th no ice could be seen from the steamer lane one hundred and fifty miles out from Churchill.

ICE MOVEMENTS

The dates on which the ice broke up in Churchill harbour are here tabulated, from 1928 to 1937:—

1928.	June 17
1929.	June 20
1930.	June 9
1931.	June 11
1932.	June 7
1933.	June 17
1934.	June 21
1935.	June 8
1936.	May 27
1937.	June 4

The dates of the close of navigation by ice in Churchill harbour, over the same span of years, are as follows:—

1928.	October 17
1929.	October 27
1930.	October 17
1931.	November 3
1932.	October 14
1933.	October 21
1934.	October 27
1935.	October 19
1936.	October 12
1937.	October 13

Shipping

Although four freighters were unloaded at Churchill in 1928 and two in 1929 the harbour was undeveloped and the cargoes were entirely for local consumption. They therefore have no significance for the statistics of commerce at the port of Churchill. The opening of Churchill as a commercial port took place in September, 1931. The beginning and the subsequent course of business may be summarized as follows: In 1931 two ships cleared with full cargoes of wheat, in 1932 ten ships, in 1933 ten ships, in 1934 fifteen ships, in 1935 eight ships, in 1936 fourteen ships, in 1937 two ships, in 1938 three ships. All these ships carried grain. In a few instances part cargo of other commodities was carried. In 1934 and subsequent years the Hudson's Bay steamship *Nascopic*, which is not in the grain

trade, handled a little freight. Beside this outbound business a small amount of inbound business was brought to the port. The latter business was handled by one ship each year. A summary of the number of ships and business handled each year is given below.

Season	No. of ships	Foreign Cargo				
		Imports			Exports	
1931	2	390.1 net tons	bunker coal	544,769	bush. 10 lb. wheat.	
1932	10	92.9	" window glass	2,736,029	hush. 50 lb. wheat.	
		326	" general cargo	987	tons flour, etc.	
1933	10	339.71	" window glass	2,707,891	bush. wheat.	
		1,448.22	" bunker coal	45.6	tons general cargo.	
		831.57	" general cargo	150,134	F.B.M. lumber.	
				19.5	tons honey.	
				200	head cattle.	
1934	15	459.38	" window glass	4,049,877	bush. 30 lb. wheat.	
		382.96	" general cargo	4,076	bush. 16 lb. mixed feed oats.	
		733.81	" bagged coal	4,253.3	tons flour, etc.	
		890.40	" bunker coal	8.1	tons honey.	
				580	head cattle.	
1935	8	686.10	" general cargo	2,399,544	F.B.M. lumber.	
		583.82	" window glass	2,407,000	hush. wheat.	
		382.00	" bagged coal			
		930.70	" bunker coal			
1936	14	540.90	" general cargo	4,293,501	bush. wheat.	
		788.10	" window glass			
		175.80	" bagged coal			
		619.40	" bunker coal			
1937	2	1,188	" general cargo	603,982	bush. wheat.	
		74	" bagged coal			
		668	" bunker coal			
1938	3	None			916,000	bush. wheat.
Totals.	64	3,955.53 net tons	general cargo	18,259,050	bush. 30 lb. wheat.	
		2,263.91	" window glass	4,076	bush. 16 lb. mixed feed oats.	
		1,015.89	" bagged coal	52,403	tons flour, etc.	
		5,296.54	" bunker coal	27.6	tons honey.	
				45.6	tons general cargo.	
				780	head cattle.	
				2,549,678	F.B.M. lumber.	

By Order in Council No. 1250, dated June 28, 1933, Churchill was proclaimed a public harbour under the Canada Shipping Act and a Harbour Master was appointed. By an Order in Council No. 1416 dated July 13, 1933, a pilotage district was established to be known as the Churchill Pilotage District with the payment of pilotage fee compulsory. The Minister of Marine was appointed the pilotage authority. By-laws for the

Churchill Pilotage District were made and enacted and pilotage dues were fixed by the Minister of Marine on July 24, 1933, and these by-laws and dues were confirmed by Order in Council No. 1546, dated August 1, 1933. By Order in Council No. 1852 dated June 28, 1933, on the recommendation of the Minister of Marine a tariff of Port Warden fees for the port of Churchill was made and established. By Order in Council No. 1251 dated June 28, 1933, the duties and functions of the Minister of Marine under the Government Harbours and Piers Act in respect to the Government wharf and pier at Churchill were transferred to the Minister of Railways and Canals. By Order in Council P.C. 1321, dated July 5, 1933, on the recommendation of the Minister of the Department of Railways and Canals, a tariff of tolls and dues for the port of Churchill was approved.

By Order in Council, P.C. 397, dated February 27, 1937, the grain elevator at Churchill, and the public harbour at that point, were transferred to the National Harbours Board, effective January 1, 1937, for administration, management and control, the National Harbours Board having at the same time taken over the grain elevators on the canals at Pt. Colborne and Prescott, Ontario, previously administered by the Department of Transport.

OTHER DEVELOPMENTS

Navigation through Hudson Bay and Strait

Prominent among the questions raised by the resumption of construction on the Hudson Bay Railway was that of lights and aids to navigation in Hudson Strait. At the outset it was seen that accurate knowledge of daily conditions in the Strait was lacking and so it was decided to send out an expedition to collect relevant data. The Government therefore on January 22nd, 1927, appointed an Advisory Board, representative of the three departments concerned, viz., Marine and Fisheries, National Defence, and Railways and Canals, to organize the expedition and to direct its activities. The plan worked out by the Board called for three bases in the Strait. Each base was to be equipped with airoplanes, to carry out patrols and make observations, as well as with the ordinary meteorological instruments. In order that they might be always in touch with one another they were equipped with wireless, and in addition, one of them was equipped with short wave so as to be in direct com-

munieation with Ottawa. According to the plan it was considered that a period of sixteen months would be ample for the completion of the investigation. The expedition sailed from Halifax on July 17th on board the C.G.S. *Stanley* with the ss. *Larch* accompanying it to carry building material and stores.

The three bases selected were Base A at Port Burwell at the eastern end of the Strait, Base C at Wakeham bay near the middle of the Strait and Base B at Nottingham island at the western end of the Strait. At each base dwellings, hangars, and storehouses were put up and a wireless mast was erected. By November 11th all three bases were completely equipped and the crews were ready for winter. The *Stanley* arrived at Quebec on November 25th.

Throughout the first winter ice conditions were observed from the ground and from the air and full meteorological observations were taken. Early in the following summer the C.G.S. *Montcalm*, icebreaker, proceeded to the Strait and observed the character of the ice in various parts of the Strait during July. A direction finding station was built at Hopes Advance to take the place of the one at Wakeham Bay and the station at Nottingham island was equipped for direction finding. At these two stations and at Port Burwell crews were maintained during the following winter, but the airplanes were sent out when the supply ship left in the Fall. The following summer the station at Port Burwell was dismantled and a direction finding station was built instead on Resolution island. These three stations are sufficient to supply vessels with bearings and positions by wireless at any part of the Strait. A direction finding station at Chesterfield inlet, working in conjunction with the direction finding station at Churchill provides vessels with bearings for crossing the bay from Coats island to Churchill.

During the summer of 1937 a new wireless station was erected at Port Harrison, on the eastern shore of Hudson Bay. This station transmits meteorological information twice daily via Churchill to Toronto. It is not equipped with direction finding apparatus.

The hazard of ice in the Strait during portions of the period of navigation is sufficiently serious to require an efficient patrol by a powerful icebreaker. To supply this service a new ice-breaker was ordered by the Department of Marine. It was launched in 1930 and named the *N. B. McLean*. She patrolled the Strait in 1930 and subsequent years, rendering valuable

assistance to steamers by keeping them advised of the location of moving ice floes and icebergs, also by giving assistance in determining ships' positions by the use of her gyro compass. A number of acetylene lights have been installed on prominent headlands and this vessel keeps them in operation every summer.

Cost

The capital cost of the Hudson Bay project to March 31st, 1938, has been as follows:—

Hudson Bay Railway	\$33,158,655	63
Terminal works at Churchill	13,263,758	66
Terminal works at Port Nelson	6,240,170	86
Department of Marine. aids to navigation	4,349,249	36
 Total	 \$57,011,834	51

Steps towards Municipal Organization

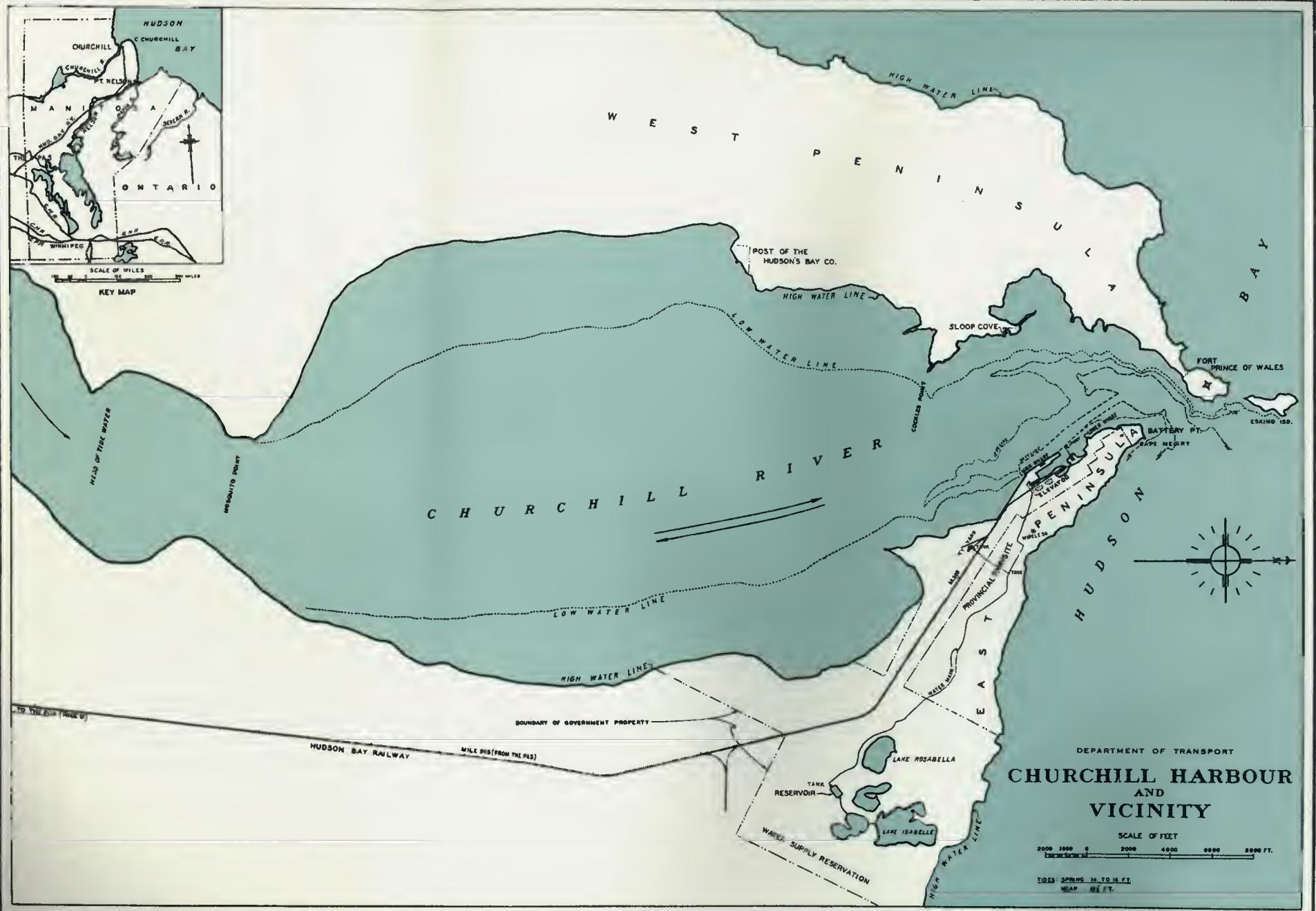
When Port Nelson was chosen as the terminus of the Hudson Bay Railway it was felt that the orderly operation of a construction camp at such an isolated spot would be promoted by the presence of a police force. Consequently in 1914 a detachment of the M Division of the R.C.M.P. was opened at Port Nelson. As the necessity for one at Churchill had ceased the post there was closed in 1918. In 1919 M Division was merged in F Division. The transfer of the terminus of the Hudson Bay Railway from Port Nelson to Churchill deprived the former place of its claim to a police post and made the latter place the most suitable place in which to establish one. Consequently, after some twelve years absence from Churchill a barracks was erected on the East peninsula near the wireless station and in 1930 the detachment went into quarters there.

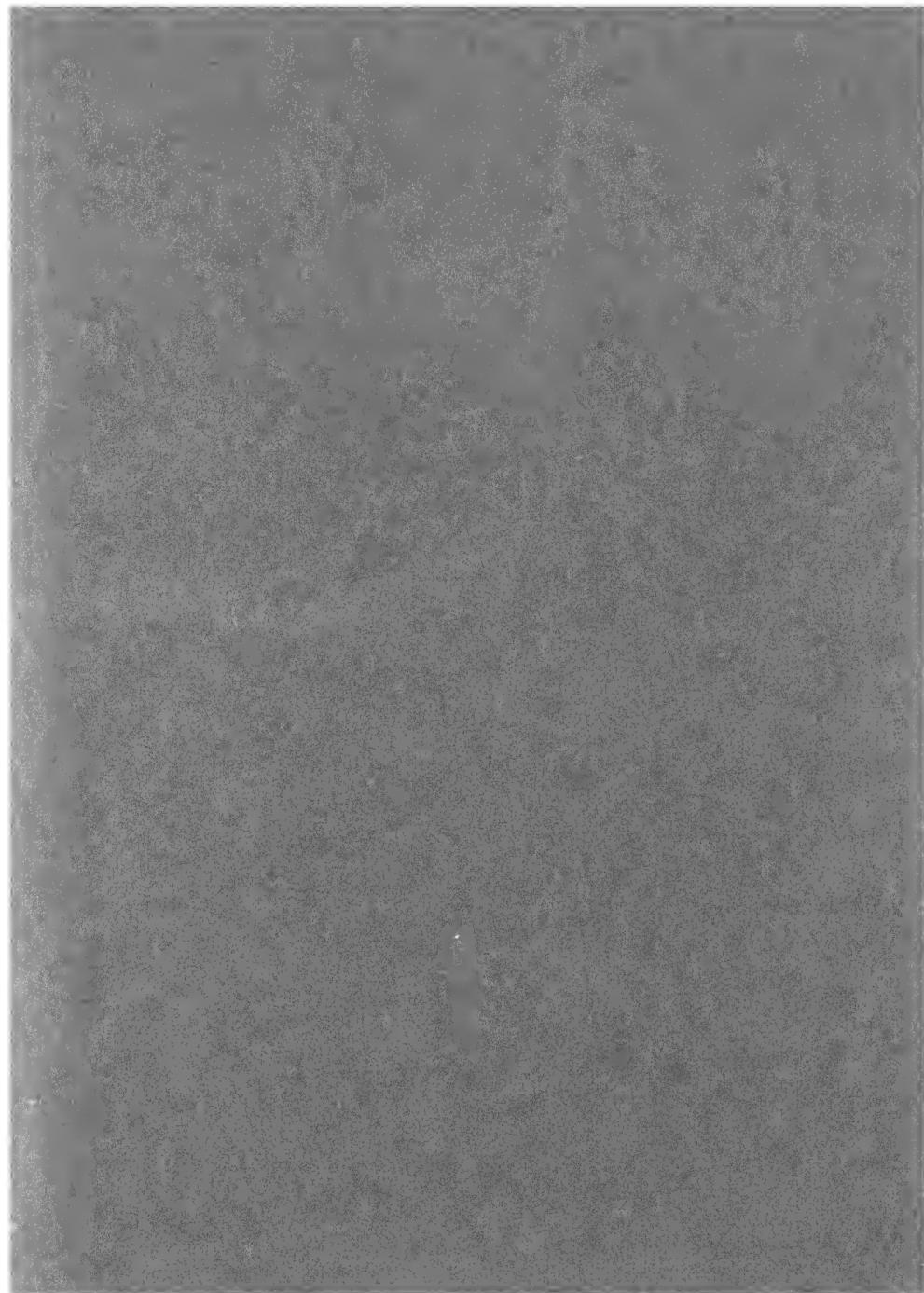
With the object of securing complete control of the lands lying outside as well as within the Beech subdivision at Churchill, the Department of Railways and Canals arranged with the Department of the Interior for the transfer of that portion of the East peninsula extending from Cape Merry, at the entrance to the harbour, to a line parallel to thirty-seventh avenue and at a distance of one mile to the southeast of it. This area was transferred by Order in Council No. 419 dated March 11th, 1929, and comprised all the lands deemed necessary for the port, the railway and the water supply. After the completion of the railway and the erection of roundhouse, tank and other terminal buildings

it was a simple matter to define the area required for railway purposes. By that time the areas required for the port, the construction camp and the water supply had been pretty well defined. It was seen at this stage that a substantial portion of the area acquired from the Department of the Interior would not be required for the above uses and could be transferred to the Province of Manitoba for the establishment of a townsite. The transfer to the Province of Manitoba of three parcels between Cape Merry and twenty-ninth avenue was effected by Order in Council No. 537 dated March 12th, 1930, and two additional parcels were transferred to the Province by Order in Council No. 101 dated January 19th, 1931.

It was the wish of the Government of Manitoba to develop Churchill townsite in an orderly and progressive manner. To this end a sloping tract of land near the railway terminus was surveyed in lots and streets as an initial development in 1931. These lots are to remain in the possession of the Provincial Government, neither grant nor sale to individuals or to corporations being allowed. Anyone who wishes to occupy one of these lots may obtain a lease by going through the regular formalities. In view of the severity of the climate in the winter, building regulations have been framed which require the settlers to put up substantial and warm houses. They must also take special precautions to reduce the fire hazard.

Before handing the townsite area over to the Province the Department did a certain amount of grading on it and afterwards the Provincial authorities did additional grading. It was not considered expedient, however, to provide public sewers or water mains. The difficulty of protecting the latter public utilities from frost in winter at this northern latitude raises a problem that is certain to entail a heavy expenditure. During the summer, so long as the construction camp is in operation, an abundance of pure water will be obtainable.





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